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THE SILVER INSTITUTE LETTER

INFORMATION ON SILVER FOR INDUSTRY

VOLUME XII NUMBER 9 DECEMBER 1982

FIRST OLYMPIC SILVER COIN DESIGN ANNOUNCED

Obverse

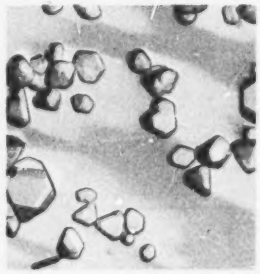
Reverse

The U.S. Mint will begin striking the first Olympic commemorative coin ever issued by the United States in early 1983. This 1983 Silver Dollar Olympic Coin, *shown at right*, is offered in Proof condition and is only the second U.S. commemorative coin issued in 900 fine silver in 18 years. It measures 38.10mm in diameter and weighs .86 troy ounce. Until December 31, 1982, this beautiful and historic 90% silver legal tender coin can be ordered from The Bureau of the Mint, 55 Mint Street, San Francisco, California 94175 for only US $24.95. By law, the price of the coin includes a surcharge of not less than $10, and the law stipulates that 50% of all surcharges received will be paid to the U.S. Olympic Committee to be used to train athletes, support local or community amateur athletic programs and to erect facilities for the training of the athletes. The remaining 50% of the amount of all surcharges shall be paid to the Los Angeles Olympic Organizing Committee to be used for staging and promoting the 1984 Olympic Games in Los Angeles.

NEW SILVER EMULSION PRODUCES HIGHEST SPEED COLOR FILM

"By altering the shape and sensitization of silver-halide crystals, we are able to substantially improve their photographic utility," said Dr. L. J. Thomas, senior vice president and director of Kodak Research when **Eastman Kodak Co.**, 343 State Street, Rochester, N.Y. 14650 recently announced its development of an extremely high speed (ISO 1000) color negative film. This new Kodacolor VR 1000 film will significantly broaden picture taking opportunities for photographers worldwide. It will allow them greater freedom to take pleasing pictures under low-light situations, while offering a choice of higher shutter speeds for stopping action and greater latitude when using telephoto lenses. It is expected to result in an important increase in the use of silver halide color film. The new film has an ISO speed rating ten times that of Kodacolor II film.

Dr. Thomas added, "We can offer photographers significantly higher speed with excellent grain and sharpness." With this new "T-grain" technology, so named because of the flat, tablet shaped appearance of silver halide grains under the microscope, Kodak has gained great flexibility when building new films. When magnified nearly 6,000 times with a scanning electron microscope, *as seen in the two pictures,* the difference between the silver halide grains in the new Kodacolor VR 1000 film (left) and the pebble-like silver halide grains found in conventional film (right) is obvious. The tiny, tablet-like grains of silver-halide provide greater surface area, requiring less exposure to light to accomplish sensitization.



Kodak chairman Walter A. Fallon said, "The new Kodacolor VR 1000 represents the biggest breakthrough in silver-halide emulsion technology in more than 50 years," and added that this and other technological advances of Kodak "will bring exciting new choices in silver-based photography to consumers during the 1980s."

ADVANCED CAMERAS RELY ON SILVER POWER

If Santa Claus brings you a new Canon A-1 camera, or a Contax RTS II, or a Leica R4, or a Minolta X-700, a Nikon FG, a Pentax LX, or a Nimslo 3-D, or any one of at least 27 of the most famous 35mm cameras, you can thank Santa for the one feature that they all have in common—the use of silver oxide-zinc batteries. The manufacturers chose silver oxide batteries for these cameras because they produce the highest and most constant voltage, thus meeting their electronic systems

demand. As though by magic, these new electronic systems automatically set shutter speeds and lens aperture, focus the camera, provide a light meter memory hold, and activate light emitting diodes that indicate the conditions under which the photograph is to be taken. The result? The photographer has to make fewer decisions in order to ensure a quality picture.

POLAROID'S NEW INSTANT "SUN" CAMERAS MAKE IT EASY TO SHARE THE SMILES

The new Polaroid "SUN" instant photography cameras offer, "A piece of the sun for every picture." Well, not really, but they do come pretty close to it by having built-in, full-time electronic flash units that fire automatically every time you take a picture, indoors or out. In addition, the camera's light blending system actually seeks out the best proportion of natural light to the light from the flash, and "turns any light into good pictures," to use Polaroid's words. Helping Polariod make the "SUN" cameras almost fool-proof is its silver halide film—the fastest-rated instant color print film in the world—Polariod 600, which ensures more pleasing exposures over a wider range of lighting situations. With the new "SUN" cameras and their silver helpers, you will find it easier than ever to take instant Holiday pictures that really do "share the moment as it happens."

NEW USES AND DEVELOPMENTS IN SILVER BASED PHOTOGRAPHY

Last December the Silver Institute Letter reported on the work of the National Measurement Laboratory, CSIRO, in Sydney, Australia to successfully create a much faster way of developing silver halide films for use in industrial three-dimensional photography. This year, once again, the unrivaled quality of the silver image manifests itself in the use of silver based 35mm ASA 100 and ASA 400 speed color negative films in the new Nimslo 35mm 3-Dimensional camera (*pictured at left*) with its unique 4-lens system that records four half-frame images on the film. Through a photofinishing process, also created by the **Nimslo Corporation,** One Nimslo Park, Atlanta, Georgia 30338, a special printer correlates the four images onto a unique plastic print material that presents the left image to the left eye and the right image to the right eye, producing a beautiful color photograph that allows one to experience the depth and detail of the original scene—a feeling of being able to reach in and touch the subject.

In addition to new uses for well established silver halide emulsions, many of the 27 papers and patents in the photography category, reported in the 1982 quarterly issues of *New Silver Technology* reflected the work of researchers in nine countries to improve on existing silver based photographic technology or to create entirely new ways of using silver in the photographic industry. For example, page 45 of the October 1982 issue reported that Alex G. Smith, Department of Astronomy, **University of Florida,** Gainesville, Florida 32611, has discovered that the use of silver nitrate to hypersensitize a Kodak Type I-Z spectroscopic plate makes it possible to obtain infrared images of quasars and galactic nuclei using very reasonable exposure times. These astronomical objects are of particular interest, since the amount of light which they emit may vary significantly over relatively short time intervals. Practically, however, the astronomer can only use a limited amount of time on the telescope to monitor the light variations. A study of 15 hypersensitization procedures surprisingly reveals that the photographic speed of a Type I-Z plate sensitized with silver nitrate exceeds the speed of an untreated plate by a most remarkable factor of 18,000!

INSTANT SLIDE SYSTEM EXPECTED IN EARLY 1983

New Polaroid instant color and black-and-white silver halide slide films will be introduced to the market early in 1983 according to a recent announcement by **The Polaroid Corporation,** 549 Technology Square, Cambridge, Massachusetts 02139. The new color slide film and the two new black-and-white slide films can be used in any scientific instrument or camera that accepts conventional 35mm film. Polaroid expects the new slide films to find many uses in professional, industrial, medical, computer graphics, and advanced amateur photography where the photographers need fast results and immediate feedback. Each cartridge of film will come with a reagent package, and its price will be competitive.

THREE NEW MEMBERS WELCOMED

The Silver Institute warmly welcomes to membership **Gulf Mineral Resources Company,** 1720 South Bellaire St., Denver, Colorado 80222, represented in Institute affairs by Manager-Business & Planning, Donald M. Jackson; **The Goldfield Corporation,** 65 East NASA Blvd., Melbourne, Florida 32901, with President James Sottile III as Official Representative; and **Hindustan Zinc Limited,** 6, New Fatehpura, Udaipur - 313001, India, represented by B. D. Sharma, Group General Manager.

FIRST SILVER SUNSHINE BULLION PROOF SET

During the recent American Numismatic Association (ANA) convention in Boston, Sunshine Bullion Co. President, Jack J. Albans, presented ANA Executive Vice President Ed Rochette, with one of the newly minted limited edition 1982 proof sets of four Sunshine medallions (*pictured at right*) to be placed on permanent display. Only 10,000 sets of these four 999 fine silver medallions in 5-, 1-, ½-, and ¼-troy ounce weights were minted. Sets of these silver collector's items are available from **Sunshine Bullion Co.,** Box 1878, Grand Central Post Office, New York, NY 10163 for $140.

FOR THE GRAND AWARD—IT'S SILVER!

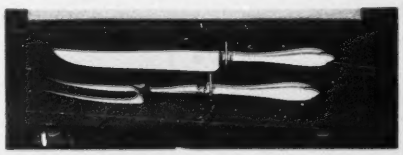
For the Grand Award for the best collection of Scandanavian rare postage stamps at Sweden's national stamp exhibition in Sollentuna, Sweden, in November, over six pounds of pure silver was used in the rendering of the impressive solid silver statuette called "The Silver Post Rider," (*pictured at left)* according to the company that donated this artistic memento of postal history, Postiljonen AB of Malmø, Sweden. The world's history is filled with references to silver awards, given to celebrate heroic deeds, victories in sporting events and military campaigns, artistic triumphs, and outstanding service to governments, civil organizations and corporations. These silver medals, trophies—such as the elegantly ornate Belmont Cup, fashioned by Tiffany & Co. (*pictured, bottom, right*)—and other types of silver awards have acted to encourage others to similar or greater efforts.

According to Michael F. Silbert of the prestigious international jewelry firm, **Cartier,** 653 Fifth Avenue, New York, N.Y. 10022, many corporations are searching for silver items of original and unique design that are also utilitarian in nature, and affordable—such as the classic sterling silver carving set *shown at bottom left.*

Cartier has created many beautiful silver items—ranging from the pictured miniature woven basket in sterling silver to magnificently graceful trophies—that are now serving corporate needs for promotional items, incentive prizes, service awards, commemorative pieces, and industrial ornaments for organizations such as Chase Manhattan Bank, IBM, Merrill Lynch Pierce Fenner & Smith Inc., American Society of Travel Agents, Estee Lauder, Mobil Oil, Renault, Monsanto Company, and Champion International.

Famed for its silver for over seven generations, **Tiffany & Co.,** Fifth Avenue & 57th Street, New York, N.Y. 10022 has created a wide variety of beautifully crafted silver items that are suitable for corporate award programs. In its model corporate Service Award Program, for example, Tiffany & Co. includes sterling silver items among its suggested awards at the 5, 10, 15, 25, and 35-year service levels. Tiffany's Corporate Division catalog includes over 40 sterling silver award products priced under $100, up to two sterling silver items priced at over $1,000. Trophies are custom-made and price estimates are provided upon request.

Because of silver's malleability, silversmiths can produce wonderful silver awards in many shapes and sizes, all in accord with the needs of the client organization. Silver assures an award of beauty!



NO SILVER REFINING TOTALS IN THIS ISSUE

Appreciation has been widely expressed for The Silver Institute's monthly figures for the production and disposition of 999 refined silver. These are the totals of individual reports which 52 cooperating refiners send confidentially to The Silver Institute. Because not all these refiners have sent their figures for the month of October, the totals cannot be presented in this issue.

NEW SILVER INSTITUTE COMMITTEES NAMED

The President of The Silver Institute, William A. Griffith of Hecla Mining Company, recently announced the composition of the Institute's committees.

W. Knies *K.D. Hoffman* *R.W. Crawford* *E.W. Hoffstatter* *G.H. Havener* *A.M.B. Hart* *W.A. Griffith*

Werner Knies of Degussa, Germany, is Chairman of the **Membership Committee** which contacts companies eligible to become members of the Institute and extends invitations to them. Other members of this committee include: Tom B. Börresen of Boliden Aktiebolag, Sweden; C.R. Buckeridge of Engelhard Industries Ltd., England; Robert Guy, N.M. Rothschild & Sons, England; Keith C. Hendrick, Noranda Sales Corp., Canada; Peter J. King, Australian Mining & Smelting Ltd., Justin Kratter, Heraeus Midland Processing Inc.; Carlos Loret de Mola, Compañía Minera Huampar, S.A., Perú; and Takanobu Sasaki, Nippon Mining Co., Ltd.

The **Market Development Committee on Silver for Industry** is concerned with monitoring world technical literature, preparing "New Silver Technology," and extending industrial uses of silver, by exploratory research and communications with industries. It is headed by Kent D. Hoffman of Kidd Creek Mines Ltd., Canada with members Maxwell R. Blair, The Broken Hill Associated Smelters Pty., Ltd., Australia; Magnus Blomkvist, Boliden Aktiebolag, Sweden; Eberhard Bosch, Dr. E. Durrwachter DODUCO KG, Germany; Barry L. Davis, ASARCO Inc.; John W. Eschenlohr, Degussa Corp., USA; Gordon L. Harris, J. W. Harris Co., Inc.; A.M.B. Hart, Johnson Matthey; Arthur Haskell, Hilemn Laboratories, Inc.; S.V.V. Lyman, Engelhard Corp.; Takashi Tanaka, Tanaka Kikinzoku Kogyo K.K., Japan.

Richard W. Crawford of Leach & Garner Co. chairs the **Market Development Committee on Silver for Coinage, Silverware, and the Arts** which is concerned with the facilitating of international silver currency issues, preparing "Modern Silver Coinage," and developing markets for silverware and silver collectibles. Other committee members are J. Caldwell Corkery of the Royal Canadian Mint; Stanley J. Dahle, The Metal Arts Co., Inc.; Kenneth A. Laidman, Engelhard Industries of Canada Ltd.; Sohier D. Marks, Mocatta Metals Corp.; Allan H. Lee, Sherritt Gordon Mines Ltd., Canada; and Dennis E. Wheeler of Coeur d'Alene Mines Corporation, and Paul Leger, Comptoir Lyon-Alemand Louyot, France.

The **Publications Committee** is concerned with the Institute's own publications, and with the Institute's work in providing information for use in other publications. Its Chairman is Edward W. Hoffstatter of Sharps, Pixley Inc. and John H. Boyd of Kennecott Corp. and Warren W. Walker of Graphite Metallizing Corp. serve as members of this committee.

The **Statistics Committee,** headed by George H. Havener of ASARCO Inc., is concerned with obtaining and reporting data on mine production of silver, refining and conversion of 999 silver, imports, exports, and changes in stocks of silver. Other committee members are J.A. Butterfield of Equity Silver Mines Ltd., Canada; Felix J. Freeman, Jr. of J. Aron & Co., Inc.; Hans-Bernd Ferner, Norddeutsche Affinerie, Germany; Enrique Serna, Jr., Industrial Minera México, S.A.; Richard Surowiec, Engelhard Corp.; and Setsuo Takashima of Mitsui Mining & Smelting Co., Ltd., Japan.

The **Finance Committee** is chaired by A.M.B. Hart of Johnson Matthey, and includes Simon D. Strauss, ASARCO Inc.; Herbert J. Coyne of J. Aron & Co., Inc.; and Institute Treasurer, William P. Lohden of Callahan Mining Corp.

The **Executive Committee** is elected by the Board, and when the Board is not in session, the Executive Committee, chaired by Institute President William A. Griffith, acts for it. Other members of this committee are Alex Schmidt-Fellner of AMAX Inc.; Charles D. Snead, Jr. of Callahan Mining Corp.; Simon D. Strauss, ASARCO Inc.; Keith C. Hendrick, Noranda Sales Corp.; and A.M.B. Hart of Johnson Matthey.

The Executive Director and Secretary of The Silver Institute, Richard L. Davies, serves as Secretary and staff to each committee.

THE SILVER INSTITUTE
A WORLDWIDE ASSOCIATION OF MINERS, REFINERS, FABRICATORS AND MANUFACTURERS
INCORPORATED 1971

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A8402-3 2/16/83

THE SILVER INSTITUTE LETTER

INFORMATION ON SILVER FOR INDUSTRY

VOLUME XIII NUMBER 1 FEBRUARY 1983

NEW SILVER INSTITUTE DIRECTORS

At The Silver Institute meeting on January 31, 1983 at the International Club in Washington, D.C., representatives of member companies from the various countries elected the following additional members of the Board of Directors: Harry B. Carson of AMAX Inc.; Ricardo Chico of Compañía Fresnillo, S.A.; Juan Sanchez-Navarro of Industrial Minera México; and R. Thomas Torro of Industrias Peñoles, S.A. The nominations were presented by Carlos Loret de Mola of Compañía Minera Huampar, S.A.

Alex Schmidt-Fellner, Chairman of the Board, presided at the meeting, and Silver Institute President William A. Griffith of Hecla Mining Company reported the recommendations of the Executive and Finance Committees for the 1983 Silver Institute program, and these were adopted. Finance Committee Chairman A.M.B. Hart of Johnson Matthey, Industrial Market Development Committee Chairman Kent Hoffman of Kidd Creek Mines, and Executive Director Richard L. Davies reported on the Institute's activities resulting in new and increased uses of silver.

President Griffith announced a plan to elicit the suggestions of all of the member companies as to ways in which The Silver Institute can be of even greater service to the industry and to all who use and can profitably use silver and silver products.

Represented at the meeting were member companies which mine and refine silver, which manufacture silver-containing products, and which regularly stock silver bullion and supply it to industry.

*Attending the Board Meeting, **Above,** l. to r., Institute Chairman Alex Schmidt-Fellner, AMAX; new Board members Harry B. Carson, AMAX and R. Thomas Torro, Peñoles Metals & Chemicals; Institute President William A. Griffith, Hecla Mining; Carlos Loret De Mola Jr. and Carlos Loret De Mola Sr. of Cía. Minera Huampar, S.A. **Below,** l. to r., A.M.B. Hart, Johnson Matthey; Debbie Weston, Kidd Creek Mines; Dennis A. Selby and Edward D. Jette of Johnson Matthey commodities; Samuel Gellis, Philipp Brothers; and Kent D. Hoffman, Kidd Creek Mines.*

*Also participating, Seiichi Ohtsuki, Mitsubishi Metal; Donald M. Jackson, Gulf Mineral Resources; James C. Buck of ASARCO; Harry L. Storey, Anaconda Minerals; and Richard L. Davies, Executive Director of The Silver Institute. **Below,** l. to r., are Tony Griffith, Kidd Creek Mines; N. Ishida, Nippon Mining Co.; Hans-Bernd Ferner, Norddeutsche Affinerie AG; Arthur C. Haskell, Hilemn Laboratories; Samuel F. Etris of The Silver Institute; and Sohier D. Marks, Mocatta Metals.*

1982 REFINED SILVER USE INCREASED WHILE PRODUCTION DECREASED

With the outstanding cooperation of silver refiners and manufacturers, The Silver Institute receives 115 reports each month of confidential individual company activities, so that totals can promptly be reported.

The 1982 totals have just been completed. They show that in the United States, the **use of commercial refined silver** (conversion by fabricating, alloying or dissolving it) for hundreds of industrial applications plus coins, medallions, and other silver pieces, **increased** to 150.2 million troy ounces in 1982. This was 7.3% above the 140.4 million troy ounces used in 1981, and 13.4% higher than the 132.5 million troy ounces used in 1980, in the United States.

Over the same periods, the **production of refined silver was decreasing,** *(Continued on page 4)*

SILVER ATTACKS CAUSE OF SLEEPING SICKNESS

Hundreds of thousands of burn victims throughout the world owe their recovery to the healing powers and germ-killing efficiency of silver sulfadiazene, and now, laboratory tests reveal that silver sulfadiazene is effective in killing *Trypanosoma rhodesiense,* a dreaded parasitic protozoa that causes the most serious type of African sleeping sickness, according to a report by M.S. Wysor and J.P. Scovil, Division of Experimental Therapeutics, Walter Reed Army Institute of Research, Washington, D.C. 22012 summarized in the January 1983 issue of The Silver Institute's quarterly publication, "New Silver Technology".

Carried by the tsetse fly, this protozoa is responsible for making an area of nearly four million square miles in Africa unfit for human habitation. Victims of sleeping sickness may experience a fever as high as 106°F (41°C) for several months, heart palpitations, difficulty in walking or speaking, and, in the final stages, emaciation and a prolonged comatose state. The survival rate is only 50-50. Efforts in killing the parasite-carrying insects have not been successful, and in some cases relocation of entire villages has been easier than destruction of the insects. In addition to infecting humans with a bite, the tsetse fly attacks cattle, horses, dogs, and donkeys.

In vivo studies of mice infected with *Trypanosoma rhodesiense* show that if left untreated, the infected mice die in 4.2 days, but the mice treated with silver sulfadiazene recover completely, becoming totally free of the parasites. Silver sulfadiazene and other silver sulfonamides represent a new class of medication for use in the fight against sleeping sickness, and the only type that can be administered orally. The use of these silver compounds can offer new hope for the future development of areas of Africa now plagued by sleeping sickness by providing people and their livestock with a healthier environment.

YUGOSLAVIA CONTINUES 2,500 YEAR HISTORY OF OLYMPIC COINAGE

Spanning 25 centuries and two hemispheres, the custom of minting special coinage in celebration of the Olympic Games links contemporary civilization with Ancient Greece, 500 years before Christ. The first known coin struck in honor of an Olympic event was a silver tetradrachme measuring 25 mm in diameter and weighing 17.5 grams, described by Aristotle as a coin minted by Anaxilas, ruler of the Greek settlement of Messana, to commemorate his chariot race victory at Olympia in 480 B.C.

Yugoslavia's Sarajevo 1984 Winter Olympic Coins do not portray a charioteer, but they are unprecedented in that they officially commemorate the first Olympic Games ever held on Yugoslavian soil. And, as in the first Olympic coinage, silver plays an important role. Of the 18 commemorative coins to be issued by the National Bank of Yugoslavia, 15 coins will have a 925 fine silver content. These sterling silver coins will be issued in five series of three coins per series, each including three denominations: the 100 Dinar silver coins will feature "Ice Sports"; the 250 Dinar, "Historical Sites and Figures"; and the 500 Dinar, "Snow Sports".

The first available sterling silver series includes a 100 Dinar coin (measuring 30 mm in diameter and weighing 13 grams) depicting "Ice Hockey"; a 250 Dinar coin showing historic and modern buildings of the Moslem city of Sarajevo, with mountains in the background (34 mm, 17 grams); and a 500 Dinar coin (38 mm in diameter and weighing 23 grams) featuring "Downhill Skiing" as pictured below. Common to all proof quality legal tender Sarajevo Olympic coins, the obverse design bears a raised image of Yugoslavia's national coat of arms alongside the official Olympic emblem—a stylized snowflake crystal crowned with the traditional five Olympic rings. And a maximum of only 110,000 of each silver coin has been authorized—a relatively small mintage for Olympic coins.

The Executive Director of the U.S. Olympic Committee, F. Don Miller, has endorsed this coin program and notes, "Three percent of the face value of the coins

sold in the U.S. is being contributed to the U.S. Olympic Committee and will be used to train . . . America's best amateur athletes . . ." Further information is available from: The Official Yugoslavia Sarajevo 1984 Winter Olympics Coin Program, P.O. Box 1984-Midtown Station, New York, N.Y. 10018.

SILVER ART BARS INCREASINGLY POPULAR

One coin store advertises a 1 Troy Ounce "Silver Bullet" Bar while another calls attention to a "1983 Valentine's Day Ingot" of 999 fine silver, but for many people in the United States, one of the most attractive bars must be the die struck proof-like finish 999 fine silver "Liberty Bar", available in 1 troy ounce (shown actual size at right), 10 ounce, and 100 ounce bars. Each bar has its own serial number and Assay Certificate. This bar is sold by the internationally famous coin and currency dealer, Manfra, Tordella & Brookes, Inc., 30 Rockefeller Plaza, 59 West 49th Street, New York, N.Y. 10112.

NEW MEMBER WELCOMED

The Silver Institute welcomed to membership, Johnson Matthey Commodities Inc., One World Trade Center, Suite 2437, New York, New York 10048, represented in Institute affairs by its President, Dennis A. Selby with its Vice President, Edward D. Jette, as Alternate Representative.

MANY VALUABLE BENEFITS FROM NEW SILVER TECHNOLOGY

The January 1983 issue begins the tenth year of publication of **New Silver Technology,** available for only US $30 for the four quarterly issues. Examples of the 60 new silver developments in 20 industrial categories from 13 countries in this issue are the following:

• Utilizing the catalytic power of silver, International Flavors & Fragrances, Inc. of New York is manufacturing compounds that can fortify, modify, and improve the flavor and aroma of foodstuffs, medicinal products, toothpastes, chewing gums, and tobaccos. (page 16)

• Ordinary Kodak "Ektachrome" color film can have its nominal speed of ASA 400 increased to ASA 20,000 by a multiple development process discovered by The Academy of Applied Science, Inc., Concord, New Hampshire. This new development process multiplies silver's unique sensitivity to light to achieve high quality photographs that have been taken underwater, or from the air, in near darkness. (page 38)

• Silver chloride is a perfect medium for high-pressure forming of hard and brittle materials. Titanium boride can be crushed into jet engine blades, machine tools, and high-speed drills when confined in a chamber with silver chloride at pressures of 116 tons per square inch. The resulting material exhibits unusual properties: increased ductility, increased workability, and most remarkably, indications of superconductivity at room temperatures. (page 47)

• In addition to the powerful action of silver in stopping bacterial action in deep wounds, a study at the Upstate Medical Center, Syracuse, N.Y., has shown that the application of a small electric current to a silver implant greatly promotes bone growth. A silver cathode is extended into the bone and a silver anode is placed under the skin near the bone. Within three weeks, new bone grows along the entire length of the cathode. (page 11)

• Lubricity of silver under high load and high temperatures has long been recognized. A new study conducted by Armco, Inc., Middletown, Ohio, has shown that silver heavily electroplated onto hard stainless steel alloys can be effective in preventing galling or gouging regardless of the stress on the moving surfaces. Applications include stainless steel valves under high pressure, and stainless steel bolts under high load condition. (page 36)

1982 REFINED SILVER USE INCREASED WHILE PRODUCTION DECREASED (continued)

from 166.3 million troy ounces in 1980, to 130.8 in 1981 and down to 108.3 million troy ounces in 1982—representing a **35% decline of U.S. production since 1980.**

In countries other than the U.S., only 21 of the *silver-using manufacturers* have been participating in our series, but their operations are considered to be typical. **They increased their use of commercial refined silver** from 61.3 in 1980, to 71.8 in 1981, to 83.6 million troy ounces in 1982—up 36% from 1980. A larger proportion of non-U.S. *refiners* participate in the series. Their **production decreased** from 271.8 in 1980, to 253.5 in 1981, to only 220.9 million troy ounces in 1982. The *silver-using manufacturers'* totals are not broken down further, but the *refiners'* totals are detailed below.

LATEST SILVER INSTITUTE REFINING STATISTICS

Production and Disposition of **999 Silver** by All Known Refiners in the United States

	TROY OUNCES		MILLION TROY OUNCES		
	December 1982	Full Year 1982	Full Yr 1982	Full Yr 1981	Full Yr 1980
THESE REFINERS' PRODUCTION, BY SOURCE					
From Primary (ores & concentrates)	4,219,766	44,250,594	44.3	44.3	40.5
From Coins	0	63,646	0.1	1.5	17.4
From Old Scrap (used photo film & other products)	2,932,781	40,047,664	40.0	56.8	74.8
From New Scrap (in-plant clippings, waste)*	4,502,039	23,889,872	23.9	28.1	33.6
TOTAL PRODUCTION	11,654,586	108,251,776	108.3	130.8	166.3
DISPOSITION BY THESE REFINERS					
Converted in Plant (consumed in fabricating, etc.)	5,735,524	38,019,349	38.0	40.8	58.6
Shipped Out as 999 Silver	7,065,272	70,489,955	70.5	90.0	108.2
TOTAL DISPOSITION	12,800,796	108,509,304	108.5	130.8	166.8
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)	−1,146,210	−257,528	−0.3	−0.0+	−0.5
THESE REFINERS' STOCKS AT END OF PERIOD	906,252	906,252	0.9	#1.2	#1.2

Production and Disposition of **999 Silver** by All Known Refiners in Australia, Canada, Mexico, Peru, South Africa, Sweden, and West Germany; and some other Refiners in Europe and Asia.

	TROY OUNCES		MILLION TROY OUNCES		
	December 1982	Full Year 1982	Full Yr 1982	Full Yr 1981	Full Yr 1980
THESE REFINERS' PRODUCTION, BY SOURCE					
From Primary (ores & concentrates)	14,635,813	141,046,917	141.0	154.5	150.6
From Coins	510,694	6,850,923	6.9	10.5	1.6
From Old Scrap (used photo film & other products)	4,216,726	49,391,075	49.4	74.8	98.6
From New Scrap (in-plant clippings, waste)*	1,579,210	23,644,601	23.6	13.7	21.1
TOTAL PRODUCTION	20,942,443	220,933,516	220.9	253.5	271.8
DISPOSITION BY THESE REFINERS					
Converted in Plant (consumed in fabricating, etc.)	3,247,818	39,234,598	39.2	63.3	84.4
Shipped Out as 999 Silver	18,212,795	184,842,037	184.8	192.7	185.1
TOTAL DISPOSITION	21,460,613	224,076,635	224.1	256.0	269.5
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)	−518,170	−3,143,119	−3.1	−2.5	+2.3
THESE REFINERS' STOCKS AT END OF PERIOD	4,694,893	4,694,893	4.7	7.8	10.4

* PRODUCTION From New Scrap is 999 silver made from in-plant clippings, spillage, sweepings, etc., generated during manufacturing processes. # Revised.

THE SILVER INSTITUTE

A WORLDWIDE ASSOCIATION OF MINERS, REFINERS, FABRICATORS AND MANUFACTURERS

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1/27/83

THE SILVER INSTITUTE LETTER

INFORMATION ON SILVER FOR INDUSTRY

VOLUME XIII NUMBER 2 APRIL 1983

EXCITING SILVER INCENTIVES

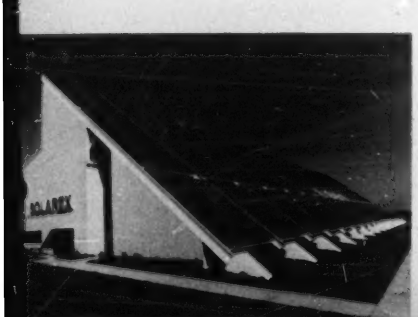
A silver tea and coffee service, a silver "Texas Nickel," and a silver "American Prospector." Every silver product can be a beautiful, unforgettable award.

Gleaming ingots of pure silver are impressive awards in the form of unusual and handsome accessories . . . such as a four-gram key ring or a four-gram pendant. These are but a few of the beautiful silver products described in a brochure presenting silver items as part of a very effective and successful incentive award program of Washington Federal Savings & Loan, 5101 Wisconsin Ave., N.W., Washington, D.C. 20016.

But Washington Federal Savings and Loan is only one of many organizations that are now using silver products to add impact to their sales incentive and personnel recognition programs. The worldwide famous General Foods is using 999 fine medallions minted by the **Texas Mint,** 16475 Dallas Pkwy., Suite 20, Dallas, Texas 75248, as a sales incentive. Canada's University of Alberta stimulates student scholarship through the use of 1.5 ounce pure silver medallions as awards for deserving students in its Faculty of Science, while the University of Waterloo in Ontario recognizes its scholars with 2½ ounce pure silver medallions. Both medallions are struck by **Johnson Matthey Ltd.,** 110 Industry Street, Toronto, Ontario M6M 4M1 Canada. A magnificent silver tea and coffee service, subtly engraved with the Scotiabank emblem, is used as a recognition award for employees with 45 to 50 years of service with the Bank of Nova Scotia. Other companies using silver premiums or awards include Chase Manhattan Bank, State Farm Insurance, Texas American Bank of Dallas, Coca-Cola, IBM, Mobile Oil, Bell Telephone Yellow Pages, Renault, Estee Lauder, and many other progressive firms and associations.

What kind of silver product makes the best award? The Canadian furniture company, Sklar Pepler, used one-half kilo pure silver ingots in a sales incentive program that boosted its share of the market to 68 percent! Other firms have recognized their best sales "prospectors" by awarding them attractive pure silver "American Prospector" medallions minted by **Engelhard Industries,** 70 Wood Avenue South, CN 770, Iselin, New Jersey 08830. In Texas, Coca-Cola has found the two troy ounce pure silver "Texas Nickel" to be the perfect incentive award for its Texan distributors. And many savings and loan institutions use sterling silver bracelets, chains, necklaces, charms, and ingot jewelry manufactured by **The Catamore Company,** One Catamore Blvd., East Providence, Rhode Island 02914 as awards to those persons who open new savings accounts. In other words, there is no *best* type of silver award because *each* kind of silver product can become a beautiful and unforgettable award.

SILVER USED IN WORLD'S FIRST SOLAR BREEDER



For the first time, a large industrial structure (pictured at left) exists which is completely powered by the sun. The Breeder is not connected to the public utility grid. It demonstrates the potential of terrestrial photovoltaics for large-scale application.

In this Breeder, built by **Solarex Corporation,** 1335 Piccard Drive, Rockville, Maryland 20850, a 200 kilowatt rooftop photovoltaic array of panels using silver cells converts sunlight directly into electricity to provide

power for the facility's production lines, which will produce silver photovoltaic cells and panels. Thus the Solarex Breeder will use power provided by silver-silicon solar cells on its roof to manufacture, or "breed," more solar cells.

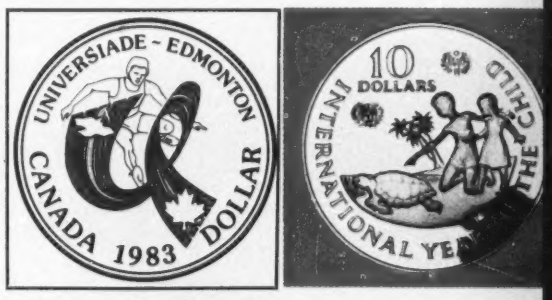
The facility derives all of its electric power, including power for lights, air conditioning, and production equipment, from the more than 3,000 semicrystalline cell panels mounted on its roof. The Breeder's photovoltaic system, aided by solar thermal energy and thermal storage, also provides for all facility heating requirements, eliminating the need for oil or gas heating. The 200 kilowatt array produces an average of 800 kilowatt hours per day of energy coupled with a 2.5 megawatt hour battery storage system. This storage capacity provides steady, uninterrupted power of 60 kilowatts in the unlikely event of as much as four days without sunlight, according to Solarex.

Developments in the field of the use of silver in mirroring and photo-electrics that have led to the Solarex Breeder have been closely followed and encouraged by the Silver Institute staff since 1974 and reported in summaries published in the Institute's quarterly, "New Silver Technology." Silver-silicon photovoltaic—or solar—cells are now used in many parts of the world to operate water pumps, electronic microwave receiving and transmitting devices, street lights, navigational aids, radios, fans, and refrigerators.

NEW SILVER NUMISMATIC COINS ENJOY INCREASING POPULARITY

Over 80 nations issued numismatic or commemorative legal tender silver coins during 1982 according to preliminary studies of The Silver Institute. In 1970, the year before The Silver Institute began providing the world's monetary authorities with previously unavailable annual information on the minting of silver coinages, only 34 countries issued legal tender silver coins.

Silver coins that commemorate athletic events have always enjoyed enormous popularity among coin collectors throughout the world, and in March 1983, Canada unveiled a new silver dollar celebrating the holding of the 1983 World University Games from July 1 through 11 in Edmonton, Alberta, Canada. This is the first time a country has minted an official coin of the realm to commemorate the World University Games.



Design of new Canadian silver dollar (left) and new sterling silver Cayman Island coin (right).

Like each of the 17 previous commemorative Canadian silver dollars issued since 1935, this coin for the Universiade has a distinctive design featuring a track and field athlete and a victory ribbon twisted to form the letter 'U' for university and the lower case 'e' for Edmonton. In their rendition of the victory ribbon, Canadian engravers used a centuries-old tradition to identify the ribbon's five colors—representing five continents—through the use of five different line patterns. In 1982 over 730,000 Canadian commemorative silver dollars were issued to collectors and it is estimated that demand for Universiade dollar, which is 50% silver, has a diameter of 36.07 mm and weighs 23.33 grams, will be significantly greater. Additional information may be obtained from **Royal Canadian Mint,** P.O. Box 457, Station A, Ottawa, Ontario K1N 8V5 Canada.

Other nations, including the People's Republic of China, Ethiopia, Cuba, Hungary, the Isle of Man, Jamaica, Panama, Poland, and Turkey issued coins in 1982 to commemorate the World Soccer Championship Games in Spain.

France increased its issuance of legal tender silver coins in 1982 by minting 5 million 900 fine silver 100-Franc coins, measuring 31 mm and weighing 15 grams, and depicting the Pantheon church in Paris. Italy commemorated the 2000th anniversary of the birth of the poet and philosopher, Virgil, with a 835 fine silver 500-Lire coin in 1982 which features a portrait of Virgil on the obverse and a bull and horse facing a tree on the coin's reverse. Other countries issued silver coins to promote international causes such as the International Year of the Child and the International Year of Disabled Persons.

In recent months, Great Britain has announced the issuance of a sterling silver (925 fine) 1 Pound 1983 coin, and for the first time in its history, Austria will use sterling silver in its 1983 coinage by issuing four 500-Schilling commemorative coins struck in 925 fine silver.

BENEFITS OF SILVER SHOWN AT KEY PROFESSIONAL CONFERENCES

The Silver Institute staff has distributed a special compilation of research reports presenting 67 advances in the use of silver to prevent wear, to professionals attending the **Fourth International Conference on Wear of Materials,** Reston, Va., April 11-14. These reports from the Institute's quarterly publication, "New Silver Technology," encourage wider use of silver in industry.

The benefits of using silver solders for joining copper pipe and tubing have been shown by The Silver Institute, and by new research conducted by the Copper Development Association. The results of this extensive research will be presented by A. G. Kireta, at the **International Brazing and Soldering Conference,** Philadelphia Civic Center, Philadelphia, Pa., April 26, at the session on Solder Developments. The Silver Institute staff will provide information to the international participants of the conference on the advantages of using silver solders.

Also, The Silver Institute will maintain a booth at the **Eighth North American Meeting on Catalysis,** May 1-4, Franklin Plaza Hotel, Philadelphia, Pa. Information on new processes made possible by silver catalysts, as well as literature of silver catalyst producers, will be made available to the international audience attending this conference.

UNIQUE SERVICES PROVIDED BY SILVER INSTITUTE

Twelve years ago, ten companies joined together in a successful effort to create an organization to work for the advancement of the interests of the *entire* silver industry. As a result, the Silver Institute was formed and today it has over 100 corporate members in 25 countries.

As the Institute has grown, the dues paid by the new member firms have been applied to doing more to encourage the development and use of silver products, help develop markets for silver and its products, and to collect and publish statistics and other information about production, distribution, marketing, consumption and the uses of silver and silver products. The Institute carries out these activities through the publication of its bimonthly "Silver Institute Letter," its unique and prestigious quarterly "New Silver Technology," another unique report, "Modern Silver Coinage," which is issued annually, and other periodic publications such as its book, "Silver Refiners of the World and their Identifying Ingot Marks" and "Mine Production of Silver."

In addition to receiving timely published information, Silver Institute members have immediate access to the Institute's library and other data on silver and the silver industry. Members also attend Silver Institute meetings where representatives of leading miners, refiners, bullion dealers and those who use silver in their products, hear up-to-date technical and statistical information of interest to all parts of the silver industry.

More recently, the Institute has aggressively promoted the use of silver products in premium, incentive, and employee recognition programs through exhibits in trade shows. And as other firms join the Institute, more new activities will be launched, and effective on-going activities will be expanded—all aimed at improving the welfare of all who produce, supply and use silver and silver products.

"SILVER" AMONG MOST POPULAR FILMS

During 1982, the 28-minute sound and color film "SILVER," produced by The Silver Institute, was shown 13,450 times to a total of 416,493 persons, making it the second most popular film in the U.S. Bureau of Mines film loan program according to a recent report by the Bureau. The Silver Institute provided 300 copies of this film to the Bureau for circulation on a free-loan basis to schools, civic and business groups, scientific and professional societies and other organizations. Just during the last quarter of 1982, "SILVER" was loaned to 1,080 organizations in the United States, most of which were high schools, colleges, and universities.

Requests to borrow prints of "SILVER" should be addressed to Motion Pictures, Bureau of Mines, U.S. Department of Interior, 4800 Forbes Ave., Pittsburgh, PA 15213 which will lend them for showing in the United States only. Copies of "SILVER" in English, or with Spanish, German, French or Japanese soundtracks, may be purchased for US$250 per copy from The Silver Institute in the form of films or TV cassettes.

LESS REFINED SILVER PRODUCTION FROM SCRAP; MORE FROM MINES

As shown in the following totals of reports by the more than 50 silver refiners which participate in The Silver Institute monthly statistics, both the U.S. participants and those in other countries produced refined silver at about the same rate in the first two months of this year, as in 1982. In both areas, however, the amounts made from secondary sources dropped, while that made from ores and concentrates increased. This was most striking in the United States, where the proportion made from coins, old scrap and new scrap dropped from 59% during 1982 to 51% for Jan-Feb 1983.

The figures below also show that the United States refiners have brought their stocks of refined silver up toward a normal level of about a one-half month supply, after reducing them nearly to zero for the closing of the 1982 calendar year.

LATEST SILVER INSTITUTE REFINING STATISTICS

Production and Disposition of **999 Silver** by All Known Refiners in the United States

	TROY OUNCES		MILLION TROY OUNCES		
	February 1983	January 1983	Jan-Feb 1983	Jan-Feb 1982	Full Yr 1982
THESE REFINERS' PRODUCTION, BY SOURCE			*MONTHLY RATE*		
From Primary (ores & concentrates)	3,828,389	4,806,667	4.3	3.7	3.7
From Coins	0	500	0.0+	0.0	0.0+
From Old Scrap (used photo film & other products)	3,307,936	3,092,346	3.2	**3.4	3.3
From New Scrap (in-plant clippings, waste)*	1,396,354	1,221,819	1.3	**1.6	2.0
TOTAL PRODUCTION	8,532,679	9,121,332	8.8	8.7	9.0
DISPOSITION BY THESE REFINERS					
Converted in Plant (consumed in fabricating, etc.)	3,061,210	2,362,601	2.7	2.3	3.2
Shipped Out as 999 Silver	4,852,616	4,122,389	4.5	5.7	5.9
TOTAL DISPOSITION	7,913,826	6,484,990	7.2	8.0	9.0
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)	+618,853	+2,636,342	+3.3	+1.4	−0.3
THESE REFINERS' STOCKS AT END OF PERIOD	4,161,447	3,542,594	4.2	2.5	0.9

Production and Disposition of **999 Silver** by All Known Refiners in Australia, Canada, Mexico, Peru, South Africa, Sweden, and West Germany; and some other Refiners in Europe and Asia.

	TROY OUNCES		MILLION TROY OUNCES		
	February 1983	January 1983	Jan-Feb 1983	Jan-Feb # 1982	Full Yr 1982
THESE REFINERS' PRODUCTION, BY SOURCE			*MONTHLY RATE*		
From Primary (ores & concentrates)	11,821,081	14,041,930	12.9	12.6	11.8
From Coins	621,063	409,739	0.5	0.7	0.6
From Old Scrap (used photo film & other products)	4,067,322	3,709,169	3.9	4.7	4.1
From New Scrap (in-plant clippings, waste)*	1,884,904	2,279,446	2.1	2.3	2.0
TOTAL PRODUCTION	18,394,370	20,440,284	19.4	19.7	18.4
DISPOSITION BY THESE REFINERS					
Converted in Plant (consumed in fabricating, etc.)	3,168,598	2,949,018	3.1	3.9	3.3
Shipped Out as 999 Silver	16,226,119	17,079,687	16.7	16.0	15.4
TOTAL DISPOSITION	19,394,717	20,028,705	19.7	19.9	18.7
RESULTING CHANGE OF THESE REFINERS' STOCKS (Production Minus Disposition)	−1,000,347	+411,579	−0.6	+0.7	−3.1
THESE REFINERS' STOCKS AT END OF PERIOD	4,106,125	5,106,472	4.1	8.6	4.7

* PRODUCTION From New Scrap is 999 silver made from in-plant clippings, spillage, sweepings, etc., generated during manufacturing processes. # Revised.

THE SILVER INSTITUTE
A WORLDWIDE ASSOCIATION OF MINERS, REFINERS, FABRICATORS AND MANUFACTURERS
INCORPORATED 1971

1001 Connecticut Avenue NW, Washington, D.C. 20036. Tel. (202) 331-1485 and 331-1228

83-B-9600

7/13/83
A-8902-3A

THE SILVER INSTITUTE LETTER

INFORMATION ON SILVER FOR INDUSTRY

VOLUME XIII NUMBER 3 JUNE 1983

SILVER INDUSTRY STARTS A NEW YEAR OF SERVICE

Some officials attending the Silver Institute Annual Meeting, ***seated l. to r.:*** *Juan Gallardo, Industrial Minera Mexico; Institute President Richard de J. Osborne, ASARCO; Executive Director Richard L. Davies; Chairman William A. Griffith, Hecla Mining; Founding Director Simon D. Strauss; Treasurer William P. Lohden, Callahan Mining; Charles D. Snead, Jr., Callahan Mining; and Founding Director Alex Schmidt-Fellner;* ***standing l. to r.:*** *Institute Vice President Harry B. Carson, AMAX; Will San Souci, J. W. Harris Co.; Enrique Ibarra, Real del Monte y Pachuca; J. A. Butterfield, Equity Silver Mines; Vice President Justin L. Rice, Coeur d'Alene Mines; Thomas Torro, Peñoles Metals & Chemicals; Robert Mansell, Engelhard; John W. Eschenlohr, Degussa; Nicholas Young, Preussag AG Metall; Paul Warrington, Noranda; A. M. B. Hart, Johnson Matthey; and John H. Boyd, Kennecott.*

Against a background display of industries' use of some of the world's most beautiful pure silver and sterling silver premiums, incentives, and recognition awards, The Silver Institute held its Annual Meeting at the Yale Club of New York City on June 24th. Among leaders of the world's silver industry elected to serve in the coming year were William A. Griffith, **Hecla Mining Co.,** as Chairman of the Board; Richard de J. Osborne, **ASARCO Inc.,** as President, and the following as Regional Vice Presidents: Kent D. Hoffman, **Kidd Creek Mines,** for Canada; Harry B. Carson, **AMAX Copper, Inc.,** for Eastern U.S.; Justin L. Rice, **Coeur d'Alene Mines Corp.,** for Western U.S.; Ricardo Chico, **Compañía Fresnillo,** for México and Central America; Alfredo Pereyra, **Empresa Minera del Centro del Perú,** for South America; Louis P. Maillard, **Comptoir Lyon-Alemand Louyot,** for Europe and Africa; Peter J. King, **Australian Mining & Smelting,** for Australia and Asia; William P. Lohden of **Callahan Mining Corp.** as Treasurer; and Richard L. Davies as Executive Director and Secretary.

Chairman Griffith and President Osborne told the 114 representatives of member companies and guests of the essential functions carried out by Silver Institute member companies—57 as miners, 60 as refiners, 36 as manufacturers, and 9 as bullion dealers. They also noted the worldwide activities of The Silver Institute member companies, with 16 operating in Canada, 37 in Eastern U.S., 34 in Western U.S., 13 in Mexico and Central America, 10 in South America, 32 in Europe and Africa, and 20 in Australia and Asia. The 130 member companies operate in 20 countries.

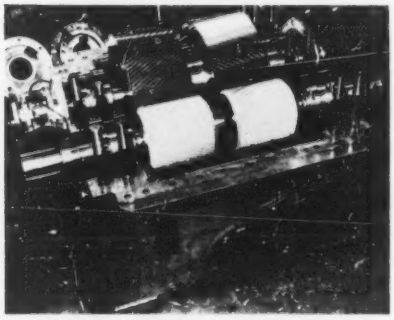
Mr. Griffith reported that the Board has now authorized additional activities for silver coinage, silver soldering and a report and projection on World Mine Production of Silver, as well as the continuation of its other on-going programs. Mr. Davies spoke of the assistance to industry in widening the profitable uses of silver by The Silver Institute staff which includes Edward J. Amatetti, Robert R. Davies, Samuel F. Etris, and David U. Groves. As an example of dynamic developments in the silver industry, he described the Institute's work in connection with the many silver-containing components in the Space Shuttle which had completed its successful mission that morning. He explained that more than 100 parts of the Space Shuttle are silver or contain silver, including 100-troy ounce silver sealing rings, brazes, as a lubricant and as plating to prevent galling.

Attending The Silver Institute Annual Meeting were, ***above l. to r.:*** *Leroy Wheelock, St. Joe International; Carlos Loret de Mola, Cia. Minera Huampar; Samuel F. Etris, The Silver Institute; and Alfonso Brazzini, Minera Perú. Also participating,* ***below l. to r.:*** *Raul Gimenez, Minera Mexico International; Sohier D. Marks, Mocatta Metals; Peggie Davies, The Silver Institute; Seiichi Ohtsuki, Mitsubishi Metal; Bruce H. Gilbert, Engelhard; N. Ishida, Nippon Mining; Robert F. Wilson, Wallace Silversmiths, Morton Sarett, Jewelry Industry Council; Raúl Benavides and Lucia Montero of Cia. de Minas Buenaventura; Kamram Habibi, E. I. du Pont de Nemours; and Louis J. Fox of J. Aron & Co.*

2

SILVER FOR LUBRICATION—FLAWLESS PERFORMANCE UNDER THE TOUGHEST CONDITIONS

For seven years now, 19 silver-electroplated high-speed gears have been operating flawlessly on the North Slope of Alaska. These gears, manufactured by the Philadelphia Gear Corporation, King of Prussia, Pa. 19406, are subject to speeds above 10,000 revolutions per minute at ratings up to 35,000 horsepower. They serve to step up the speed of high-speed compressors, coupled to gas-turbine prime movers, that inject natural gas into wells to stimulate oil output. The gears, pictured here, are silver plated to prevent galling, which is the tearing apart of momentarily-welded surfaces caused by the lack of lubrication. At these speeds, under these pressures, and under the rugged conditions of the Alaska North Slope, galling may wear down gear faces rapidly. Silver provides the assurance of flawless, long-term performance.



The practical usefulness of silver is not limited to such conditions as these. For example, **over 75 developments in silver for lubrication and bearings have been reported in New Silver Technology.** And the July 1983 issue will describe new work of Dr. K. G. Budinski of Eastman Kodak Co., Rochester, N.Y. 14650. His work shows that the resistance of silver for metal-to-metal wear far surpasses that of all other commonly used bearing faces. Furthermore, in galling tests, metallic silver alone acts very much like a petroleum-type lubricant, smearing over the contact surfaces, preventing sticking or "welding." This can be advantageous in industrial chemical processes where bearing surfaces cannot be lubricated with petroleum compounds which are incompatible with the chemical being processed.

Its superlative fatigue strength, combined with its high thermal conductivity, tensile strength, and other properties have made silver the ultimate choice wherever high power systems like turbine and diesel engines require flawless performance. One plant, the Detroit Diesel Allison Division of **General Motors,** Indianapolis, IN 46206, uses about 10,000 troy ounces of silver per month to silver plate sleeve bearings, connecting rods, sliding contacts, and other parts for diesel engines, turbochargers for railway locomotives, and for gas turbines for aircraft. In some cases the silver is plated as a pure metal, in others as a low lead, silver alloy.

Recent studies by W. Schumacher of **Armco Inc.,** Middletown, OH 45042, testing the galling resistance of silver-plated stainless steels, as reported in New Silver Technology for January, 1983, show that silver plate protected all sliding stainless steel alloy parts tested regardless of surface finish, composition, or hardness of the alloy. The tests showed the efficacy of metallic silver coatings for stainless steel valves under high stress conditions such as in power plants. Silver provided an adherent and durable bearing surface—"easily the best coating evaluated."

SILVER SOLDERS FEATURED AT INTERNATIONAL SOLDERING AND BRAZING CONFERENCE IN PHILADELPHIA

The Silver Institute and the Copper Development Association jointly sponsored the presentation of "Silver-Tin Solders for Large Diameter Copper Pipe," by A. G. Kireta *(pictured at left)* and W. E. Coffey, at the 14th International Soldering and Brazing Conference, April 26, at Philadelphia, PA. The presentation covered the findings of an extensive study of the performance of soldered and brazed copper pipe over 4 inches in diameter conducted by the Copper Development Association. The portion dealing with the performance of the silver-tin solders and silver brazes was discussed and illustrated.

The study was conducted to provide the installer with soldering and brazing techniques that will ensure a superior bond between sections of large diameter copper pipe. The new techniques that were discovered have now been published by the Copper Development Association in "Fabrication of Larger Diameter Tube and Fitting Systems," No. 404/3.

Silver-tin solders and silver brazes, because of their outstanding wetting of metals, extremely high strength and creep resistance, and unmatched benignity to potable waters in contact with them, are the *preferred* bonding materials for hospital potable water systems, water cooling drinking

fountains, ice-makers, etc. Silver brazes are especially preferred in refrigeration units where the expansion and contraction forces exert high strain on the metal-to-metal joints, and in water sprinkler systems where the integrity of bonds must withstand sharp temperature differences.

The well-attended Soldering session was made even more interesting by the Welding Show exhibits of Silver Institute member companies: **Engelhard Corporation,** 70 Wood Avenue South, Iselin, NJ 08830; **J. W. Harris Co., Inc.,** 10930 Deerfield Road, Cincinnati, OH 45242; and **Connecticut Engineering Associates Corporation,** Box 656, Newtown, CT 06482.

NEW MEMBER WELCOMED

The Silver Institute welcomed to membership **Compagnie des Métaux Précieux,** 4, rue Beaubourg, 75004 Paris, France, represented in Institute affairs by its President, V. P. Marciandi. Silver Institute members produce silver and silver products in Australia, Austria, Brazil, Canada, Chile, England, France, Germany, Honduras, India, Italy, Japan, Mexico, Peru, Philippines, South Africa, Spain, Sweden, Switzerland, and the United States.

THOUSANDS ADMIRE SILVER INCENTIVE AWARD PRODUCTS

Over 15,000 registered buyers of premiums and incentive awards visited the Silver Institute's attractive display of silver ingots, medallions, coins, and jewelry at the 45th Annual Premium Incentive Show held May 2-5 in the New York City Coliseum.

Consumer premium buyers were enthusiastic about converting small silver ingots into inexpensive, yet elegant, tie tacs, stick pins, pendants, and cuff links such as those displayed by **Rembrandt Jewelry Mfg. Ltd.,** 1100 Birchmount Road, Scarborough, Ontario M1K 5E5, Canada. Persons involved in sales incentive programs spoke of using a combination of larger pure silver ingots, adorned with a sponsoring company's logo, produced and displayed by **Engelhard Corp.,** 70 Wood Avenue South, Iselin, NJ 08830 and **Johnson Matthey Ltd.,** 110 Industry St., Toronto, Ontario M6M 4M1, Canada and finely wrought "Sunshine" silver medallions by **Sunshine Bullion,** 500 Plaza of the Americas, South Dallas, Texas 75201 or Engelhard's popular silver "American Prospector" medallions to motivate their sales forces.

Many other buyers favored sculpted silver medallions, showing portraits of corporate leaders, products, or scenes such as those fashioned and exhibited by Johnson Matthey and the **Texas Mint,** 16475 Dallas Parkway, Suite 20, Dallas, Texas 75248 which also displayed its popular pure silver "Texas Nickel" and golf tees. All these silver items are used in dealer incentive, consumer premium, and sales incentive award programs. Among the visitors indicating usage of, or interest in use of silver incentives were representatives of Nationwide Insurance, E. F. Hutton, Holiday Inns, BIC, CASIO electronics firm, New York Life Insurance, and many other leading industrial advertising, and marketing organizations.

At the June 24 Annual Meeting of The Silver Institute, silver industry leaders enjoyed **brief presentations on the exciting, growing new market for silver premiums and incentive awards** by Robert Mansell of Engelhard Corp., A. M. B. Hart of Johnson Matthey Jewelry Corp., Jack Albans of Sunshine Mining, Robert Johnston of the Sterling Silversmiths Guild of America, and David U. Groves of The Silver Institute.

An impressive display of pure silver and sterling silver awards was exhibited at this Annual Meeting by Tiffany & Co., Rembrandt Jewelry Mfg., Texas Mint, Engelhard Corp., Gorham Co., Sunshine Mining Co., Reed & Barton, Refinement International Co., Lunt Silversmiths, Oneida, Johnson Matthey, Degussa Corp., International Silver, Kirk Stieff Co., Towle Manufacturing Co., Royal Canadian Mint and Wallace Silversmiths.

L. to r.: David U. Groves shows Silver Institute incentive award display to Pamela McCusker, Rhode Island Hospital Trust National Bank. Managing the display of Tiffany awards, Michael A. D'Errico, William Christopher, and Pauline Smith. Robert N. Johnston of Sterling Silversmiths Guild of America. Patricia Walker, American Metal Market, views silver incentive products. Part of Institute display.

4

CHANGING PRODUCTION OF REFINED SILVER

With the extraordinary cooperation of silver refining companies, The Silver Institute provides precise monthly totals on the production of refined silver by all U.S. refiners and by representative refiners in other countries, as reported below for March, April and May. This information serves to avoid mistaken or speculative decisions in silver related businesses. Following are comparative figures for previous periods.

Refined Silver Production:	Monthly Rate in Million Troy Ounces		
	U.S.	Non-U.S.	Total
1980	13.9	22.6	36.5
1981	10.0	21.1	32.0
1982	9.0	18.4	27.4
Jan-May 1983	8.8	20.7	29.5

LATEST SILVER INSTITUTE REFINING STATISTICS

Production and Disposition of **999 Silver** by All Known Refiners in the United States

	TROY OUNCES			MILLION TR. OZ.	
	May 1983	April 1983	March 1983	Jan-May 1983	Full Yr 1982
THESE REFINERS' PRODUCTION, BY SOURCE				*MONTHLY RATE*	
From Primary (ores & concentrates)	2,726,311	4,362,457	3,724,199	3.9	3.7
From Coins	2,000	10,000	3,000	0.0+	0.0+
From Old Scrap (used photo film & other products)	2,936,465	3,459,376	3,413,749	3.2	3.3
From New Scrap (in-plant clippings, waste)*	1,998,002	1,820,848	1,992,138	1.7	2.0
TOTAL PRODUCTION	7,662,778	9,652,681	9,063,086	8.8	9.0
DISPOSITION BY THESE REFINERS					
Converted in Plant (consumed in fabricating, etc.)	3,337,444	3,851,351	3,582,200	3.2	3.2
Shipped Out as 999 Silver	6,641,916	5,514,816	5,804,393	5.4	5.9
TOTAL DISPOSITION	9,979,360	9,366,167	9,386,593	8.6	9.0
RESULTING CHANGE OF THESE REFINERS'				*TOTAL FOR PERIOD*	
STOCKS (Production Minus Disposition)	−2,316,582	+286,514	−323,507	+0.9	−0.3
THESE REFINERS' STOCKS AT END OF PERIOD	1,807,872	4,124,454	3,837,940	1.8	0.9

Production and Disposition of **999 Silver** by All Known Refiners in Australia, Canada, Mexico, Peru, South Africa, Sweden, and West Germany; and some other Refiners in Europe and Asia.

	TROY OUNCES			MILLION TR. OZ.	
	May 1983	April 1983	March 1983	Jan-May 1983	Full Yr 1982
THESE REFINERS' PRODUCTION, BY SOURCE				*MONTHLY RATE*	
From Primary (ores & concentrates)	12,904,191	13,884,241	11,884,334	12.9	11.8
From Coins	200,024	264,941	628,597	0.4	0.6
From Old Scrap (used photo film & other products)	6,739,748	7,216,364	7,163,354	6.2	5.0
From New Scrap (in-plant clippings, waste)*	1,143,598	1,094,442	1,359,434	1.1	1.0
TOTAL PRODUCTION	20,987,561	22,459,988	21,035,719	20.7	18.4
DISPOSITION BY THESE REFINERS					
Converted in Plant (consumed in fabricating, etc.)	3,818,213	4,149,829	3,712,262	3.6	3.3
Shipped Out as 999 Silver	17,584,004	17,507,748	17,803,889	17.2	15.4
TOTAL DISPOSITION	21,402,217	21,657,577	21,516,151	20.8	18.7
RESULTING CHANGE OF THESE REFINERS'				*TOTAL FOR PERIOD*	
STOCKS (Production Minus Disposition)	−414,656	+802,411	−480,432	−0.7	−3.1
THESE REFINERS' STOCKS AT END OF PERIOD	4,013,448	4,428,104	3,625,693	4.0	4.7

* PRODUCTION From New Scrap is 999 silver made from in-plant clippings, spillage, sweepings, etc., generated during manufacturing processes.

THE SILVER INSTITUTE

A WORLDWIDE ASSOCIATION OF MINERS, REFINERS, FABRICATORS AND MANUFACTURERS

INCORPORATED 1971

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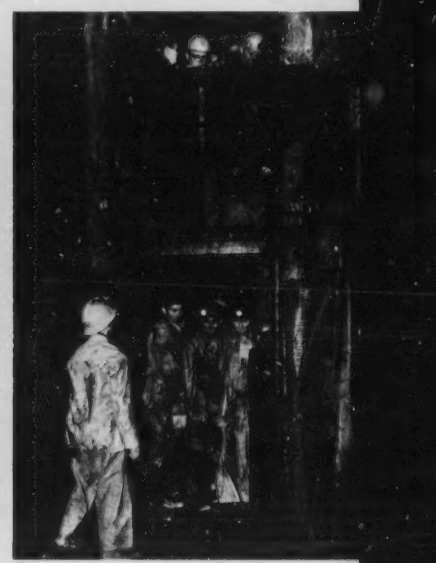
THE SILVER INSTITUTE LETTER

INFORMATION ON SILVER FOR INDUSTRY

VOLUME XIII NUMBER 4 AUGUST 1983

MINERS GO DEEPER TO PRODUCE PRECIOUS SILVER



Two thousand years ago shepherds in the Pyrenees mountains of Spain needed only to set forest fires whose heat would release silver from outcropping sulfides, resulting in sparkling rivulets of molten silver pouring down the mountain sides. As the years went on the Carthaginians and then the Romans dug mines in the same locations to gain silver which was the accepted trade currency for the ancient Spice Trade with India.

It was the drive for this that sent Columbus to the New World. The conquistadores who responded to his reports began to tap the silver ores in what is now Peru, Bolivia, and Mexico.

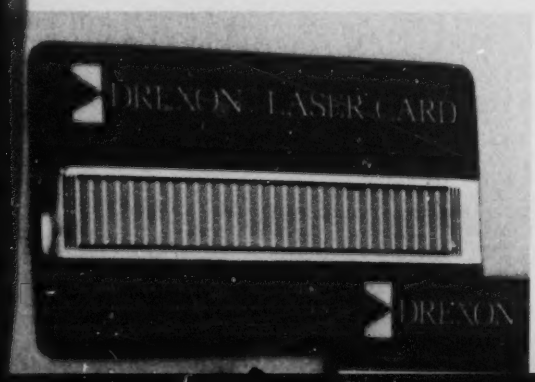
It is in the Cordilleras, the backbone of the American continents, that the richest sources of silver are to be found. The photo *(near right)* shows a modern Mexican miner deep underground in the mines of Compañía de Real del Monte y Pachuca, S.A., Hidalgo, México, which have been producing silver requiring continuously improving technology for more than 400 years.

In North America, the richest sources of silver are now being worked in the Silver Valley of Idaho, where the men of Hecla Mining Company of Wallace, Idaho work 6,200 feet below the surface, mining ore which may contain 18 troy ounces of silver per ton. The photo *(far right)* shows them coming off shift into "man cages" to be hoisted to the surface.

As the years go on, available silver veins are less rich and deeper, and the silver miners are constantly applying innovative, safe, and effective technology to win that most versatile precious metal, silver.

SILVER SOLUTION TO BUSINESS PROBLEMS

Silver continues to play an essential role as major corporations move closer toward commercial usage of an advanced system, called the DREXON card, which could change the way the world does much of its information processing. The DREXON card, by Drexler Technology Corp., Mountain View, California, is capable of extremely compact, low-cost storage of very large amounts of digital information, using a **silver-containing emulsion** as the recording stripe. A wallet-sized card *(pictured below)* containing a DREXON recording stripe measuring 35-mm × 80-mm can store 16 million bits of user information, or about 10,000 times the amount of information that can be stored on the magnetic stripes of today's credit cards, bank cards, and identification cards. The possible business applications are immense.



Nine companies have already joined Drexler's equipment-development program designed to accelerate commercial introduction of read/write equipment for use with **silver-striped DREXON cards.** News of their participation has already ignited a flurry of inquiries regarding possible applications. Mr. Carl Travillion, Director of Product Management of NCR Corp.,

Dayton, Ohio, the worldwide manufacturer of business machines, participating in the program reports, "I have been amazed at the interest shown by so many industries with such widely varied application needs. The attributes of the card, namely its increased storage capacity, long life, portability, low-cost, and high speed, have opened up a whole new frontier of possible solutions to a wide range of business problems. Some of these problems had until now been viewed by the business community as unsolvable!"

The eight other participating companies are: CANON, a leader in office automation; Elbit Computers in Israel; Ericsson Information Systems, Sweden's global telecommunications company; Logitec Corp., producers of microcomputers and video games; OMRON Tateisi Electronics, a leader in bank automation; Toshiba Corp.; Fujitsu Ltd.; and Wang Laboratories, Inc.

The development of DREXON has been followed closely by The Silver Institute, and has been previously reported in the January and April 1982 issues of NEW SILVER TECHNOLOGY, as well as the April 1982 issue of The Silver Institute Letter. Now, the July 1983 NST issue describes a DREXON of improved uniform reflectivity, further enhancing the commercial potential of the **silver-striped cards.**

MINTS MOVE TO MORE STERLING SILVER COINAGES

There is something special about a sterling silver coin. The "something special" makes a person want to possess it more than coins with a lower silver content. Because of this, in 1983, mints from **Austria** to **Singapore** have been minting sterling silver coins.

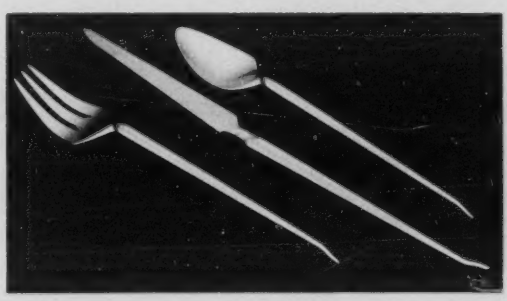
For Austria, a nation famous for its most attractive silver coinage, four 500-Schilling commemorative sterling—or 925 fine—silver commemorative coins will be struck for the first time in the country's history. The first of these is the coin, *shown at left,* commemorating the centennial of the Vienna city hall, or Rathaus. Other sterling silver coins commemorate the Austrian Catholic Day, the centennial of the Parliament building, and the World Cup International Championship of Horse Jumping.

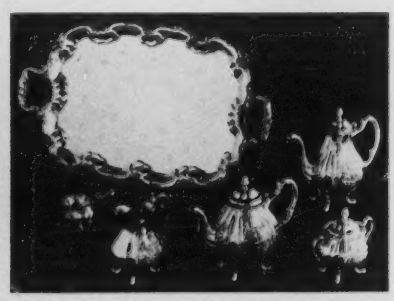
And for the first time in its history, **Sweden** is issuing two sterling silver commemorative pieces in one year. The first 925 fine silver coin commemorates the 10th anniversary of the reign of King Carl XVI Gustaf. Mintage has been limited to 100,000. Another sterling silver coin, with a mintage of 400,000, is planned to mark the reconstruction of the Swedish Parliament.

The **Isle of Man** also used sterling silver coins to celebrate 200 years of Manned Flight. The beautiful silver "One Crown" coin depicting the first flight by the Montgolfier Balloon in 1783 is *shown at right.* It made a journey of six miles in 25 minutes. Other sterling silver coins in this set show the Wright Brothers Flyer, the Gloster-Whittle Jet, and the Orbiter Space Shuttle.

WORLD'S SILVERSMITHS CONTINUE CREATING WORKS OF ART

In the United States, 43 students of design and metal artistry from 21 colleges and graduate schools recently entered the Sterling Silver Design Competition originated by the Sterling Silversmiths Guild 29 years ago, and sponsored in 1983 by Towle Silversmiths, Newburyport, Massachusetts. The photos show Towle President Edward W. Mulligan presenting the US$2,000

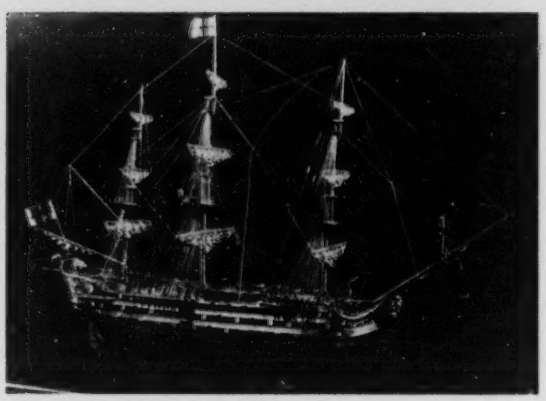




first prize check to Carrie Harper of Boston University, and her refreshing three piece set of sterling flatware.

The pictured complete tea and coffee service in hammered 915 fine silver by Pasgorcy, S.A., won Spain's "Brindis Iberjoya '83" Silverware Award.

In Italy at the 1983 Florence Gift Mart, of the 330 exhibiting firms, 50 were companies of silversmiths, another indication of the good health of this ancient international craft.



In addition to beautiful sterling silver flatware and holloware, silversmiths still produce wonderfully detailed specialty items such as the solid silver model of H.M.S. Victory shown in the photo. It measures 102 cm in length by 75 cm in height and weighs 11 kg—or 24.2 pounds. It was created by Carlo Mario Camusso S.A. of Lima, Peru.

INSTITUTE WELCOMES NEW MEMBERS

Welcomed to membership in The Silver Institute this month are **Brink's Inc.,** 42 Broadway, New York, N.Y. 10004, Tel: (212) 558-6180 with Richard E. Hart, Director-Precious Metals, as Official Representative; **Gemark Corp.,** 216 DuPont Ave., Newburgh, N.Y. 12550, Tel: (914) 561-1720 with Gerard Macri, President, as Official Representative; and **Westbury Alloys, Inc.,** 750 Shames Drive, Westbury, N.Y. 11590, Tel: (516) 997-8333 with Lawrence S. Wilson, Operations Manager, as Official Representative, and Lawrence D. Raskin, President, as Alternate Official Representative.

MANY BENEFICIAL NEW SILVER TECHNOLOGICAL DEVELOPMENTS REPORTED

Out of 900 reports of new research on silver and its products from throughout the world monitored by The Silver Institute, 60 advances which appear to be most likely to affect the industrial uses of silver in the near future were selected, summarized, and published in the July 1983 issue of Silver Institute's quarterly NEW SILVER TECHNOLOGY.

The items selected for this issue came from universities, researchers, government agencies, and industrial firms in Canada, France, German Federal Republic, Great Britain, India, Italy, Japan, the Netherlands, Singapore, Sweden, Switzerland, U.S.S.R., and the United States.

In addition to the information on the improved silver-striped Drexon Laser Cards reported in this SILVER INSTITUTE LETTER, the July 1983 issue of NEW SILVER TECHNOLOGY also includes many other interesting developments such as the following:

- E.I. du Pont de Nemours and Co., of Wilmington, Delaware has developed a highly flexible silver coating for use in the manufacture of membrane touch switches.
- Erich Alhäuser, of the German Federal Republic, utilizes the bactericidal effects of silver to obtain higher quality drinking water.
- The Upjohn Co., Kalamazoo, Michigan uses silver oxide to produce a new male temporary contraceptive which is effective without diminishing sex drive or secondary male characteristics.
- Fuji Electric Co., Ltd., Tokyo, Japan is adding silver to a nickel monoxide catalyst, greatly improving the catalyst's ability to decompose ozone, a major air pollutant and cause of considerable eye irritation.
- Robert Monroe, of New York City, employs silver halides in a new photographic developing and processing technique that produces an illusion of depth in a single print.
- John William Grenier, Federal Republic of Germany, has developed for General Electric, a new, simple technique for the electroless deposition of elemental silver onto diamond powder, making it effective for industrial dry grinding of cemented carbide substrates.
- BASF Wyandotte Corp., Parsippany, New Jersey, has produced a new silver ion gel composition that prevents bacterial infection of burn wounds and of superficial ulcers over a wide range of temperatures.

For only US$30 for the year, NEW SILVER TECHNOLOGY subscribers will be kept informed of new silver developments in 20 industrial categories.

PHOTOGRAPHIC USE OF SILVER CONTINUES TO GROW

Analyses of latest Japan Mining Industry Association and U.S. Bureau of Mines reports show that the *average monthly rates* of silver consumption for photo products in Japan and U.S. have continued to increase as follows.

	JAPAN		U.S.	
	Million Troy Ozs.	% Change	Million Troy Ozs.	% Change
1981	2.828	—	4.252	—
1982	3.053	+8.0%	4.314	+1.4%
1st Qtr. 1983	3.178	+4.1%	4.511	+4.6%

LATEST SILVER INSTITUTE REFINING STATISTICS

Production and Disposition of **999 Silver** by All Known Refiners in the United States

	TROY OUNCES		MILLION TR. OZ.		
	June 1983	May 1983	Jan-Jun 1983	Jan-Jun 1982	Full Yr 1982
THESE REFINERS' PRODUCTION, BY SOURCE			*MONTHLY RATE*		
From Primary (ores & concentrates)	5,387,056	2,726,311	4.1	3.8	3.7
From Coins	500	2,000	0.0+	0.0+	0.0+
From Old Scrap (used photo film & other products)	2,983,600	2,936,465	3.2	3.5	3.3
From New Scrap (in-plant clippings, waste)*	1,839,125	1,998,002	1.7	1.7	2.0
TOTAL PRODUCTION	10,210,281	7,662,778	9.0	9.1	9.0
DISPOSITION BY THESE REFINERS					
Converted in Plant (consumed in fabricating, etc.)	3,229,866	3,337,444	3.2	2.8	3.2
Shipped Out as 999 Silver	7,640,410	6,641,916	5.8	5.6	5.9
TOTAL DISPOSITION	10,870,276	9,979,360	9.0	8.4	9.0
RESULTING CHANGE OF THESE REFINERS'			*TOTAL FOR PERIOD*		
STOCKS (Production Minus Disposition)	−659,995	−2,316,582	+0.2	+4.2	−0.3
THESE REFINERS' STOCKS AT END OF PERIOD	1,147,877	1,807,872	1.1	5.3	0.9

Production and Disposition of **999 Silver** by All Known Refiners in Australia, Canada, Mexico, Peru, South Africa, Sweden, and West Germany; and some other Refiners in Europe and Asia.

	TROY OUNCES		MILLION TR. OZ.		
	June 1983	May 1983	Jan-Jun 1983	Jan-Jun 1982	Full Yr 1982
THESE REFINERS' PRODUCTION, BY SOURCE			*MONTHLY RATE*		
From Primary (ores & concentrates)	12,395,995	12,904,191	12.8	11.6	11.8
From Coins	160,061	200,024	0.4	0.7	0.6
From Old Scrap (used photo film & other products)	6,028,695	6,739,748	6.2	#4.9	5.0
From New Scrap (in-plant clippings, waste)*	1,140,471	1,143,598	1.1	#1.2	1.0
TOTAL PRODUCTION	19,725,222	20,987,561	20.5	18.3	18.4
DISPOSITION BY THESE REFINERS					
Converted in Plant (consumed in fabricating, etc.)	2,600,483	3,818,213	3.4	3.2	3.3
Shipped Out as 999 Silver	16,896,428	17,584,004	17.2	15.5	15.4
TOTAL DISPOSITION	19,496,911	21,402,217	20.6	18.7	18.7
RESULTING CHANGE OF THESE REFINERS'			*TOTAL FOR PERIOD*		
STOCKS (Production Minus Disposition)	+228,311	−414,656	−0.5	−2.5	−3.1
THESE REFINERS' STOCKS AT END OF PERIOD	4,241,759	4,013,448	4.2	5.3	4.7

* PRODUCTION From New Scrap is 999 silver made from in-plant clippings, spillage, sweepings, etc., generated during manufacturing processes. # Revised.

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THE SILVER INSTITUTE LETTER

INFORMATION ON SILVER FOR INDUSTRY

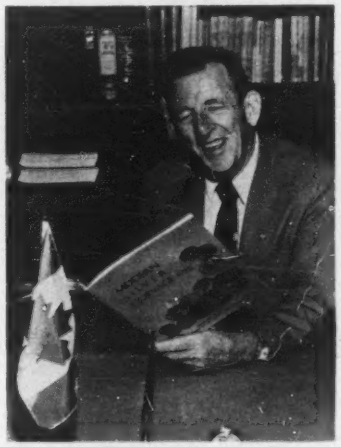
VOLUME XIII NUMBER 5 OCTOBER 1983

DRAMATIC INCREASE IN SILVER COINAGE

During 1982, 9,251,840 troy ounces of silver were used in coinage throughout the world. This represents *a rise of 56%* above the 5,904,842 troy ounces of silver used in mintages in 1981, according to the Silver Institute's publication, **"Modern Silver Coinage-1982"**.

In addition, there was a marked increase in the number of types of coins minted. Last year, 275 types of silver coins were issued, up from 258 issues in 1981. The coinage publication also revealed that the total of countries issuing money in silver in 1982 increased slightly to 83 countries compared to 82 in the previous year.

Commenting on **"Modern Silver Coinage-1982"**, an Executive Director of the International Monetary Fund, Mr. Robert K. Joyce, noted: For most nations, the striking and distribution of silver money is a source of government revenue, and of foreign exchange when the pieces are distributed abroad. It also increases confidence in the country's currency and provides positive publicity for the nation.



Mr. Robert K. Joyce, Executive Director of the International Monetary Fund, notes the dramatic increase in silver used for coinage, as reported in MODERN SILVER COINAGE-1982.

The United States was the leading issuer of silver coinage in 1982, containing 1,842,901 troy ounces of silver in four types of coins. Most of this was in the mintage of 4,997,065 specimens of the 50-Cent George Washington piece in 90% pure silver, honoring the 250th anniversary of Washington's birth. Austria followed by using 1.4 million troy ounces in the striking of four commemorative issues, closely followed by France which turned 1.3 million ounces of silver into 100 Franc coins portraying the Pantheon in Paris, burial place of France's heroes.

"Modern Silver Coinage-1982" was published at the end of September after many months of worldwide consultation with central banks, mints, treasuries and numismatists and is a *truly unique publication* because it is the *only* single publication that provides its readers with a report on every mintage issued last year with descriptions of designs, sizes, weights, fineness, pure silver content, the number of coins in each issue, and the amount of silver used. It also gives the name and address of the mint through which each coin may be ordered, and it is available for only US $15.00, postage included, from The Silver Institute, 1001 Connecticut Avenue, N.W., Suite 1140, Washington, D.C. 20036, USA.

SILVER INSTITUTE BOARD MEETS

Members of The Silver Institute Board of Directors and guests, from eight countries, met in San Francisco in September. In addition to receiving the first copies of Modern Silver Coinage-1982, they added to the Board of Directors Bruce W. Gilbert of Kidd Creek Mines Ltd. and Jacques Bagory of Comptoir Lyon-Alemand Louyot, and elected M. Bagory to become Vice President of The Silver Institute for Europe and Africa.

Institute Chairman William A. Griffith reported on the market survey which shows a great potential demand for silver coinage which could be issued by the United States. Institute President Richard de J. Osborne described the current work of the Institute and presented the Executive Committee's recommendations for the coming year's program. This will include the research and publication of New Silver Technology, Modern Silver Coinage, World Mine Production of Silver 1982-1986, and The Silver Institute Letter; and special projects to further develop the use of silver for steel welding rods, swimming

Attending The Silver Institute meeting of the Board of Directors were (l. to r.): Seiichi Ohtsuki, Mitsubishi Metal; Richard de J. Osborne, ASARCO; Takashi Tanaka, Tanaka K.K.; Rafael Errázuriz, Cía. Minera y Comercial Sali Hochschild; Robert M. Reininger, Founding Director; Silver Institute Vice President for Mexico and Central America Ricardo Chico of Cía. Fresnillo, S.A.; G. Michael Boswell, Sunshine Mining; Sohier D. Marks, Mocatta Metals; and Charles D. Snead, Callahan Mining.

Also at the Silver Institute meetings were (l. to r.): Thomas R. N. Main, Rand Refinery Ltd.; Silver Institute Vice President for Eastern United States Harry B. Carson, AMAX Copper; Felix J. Freeman, J. Aron; A.M.B. Hart, Johnson Matthey, Chester N. Truax, American Mining Congress; John F. Rutter, Polaroid; Enrique Ibarra, Cía. de Real del Monte y Pachuca, S.A.; and luncheon meeting receiving the Executive Director's Report.

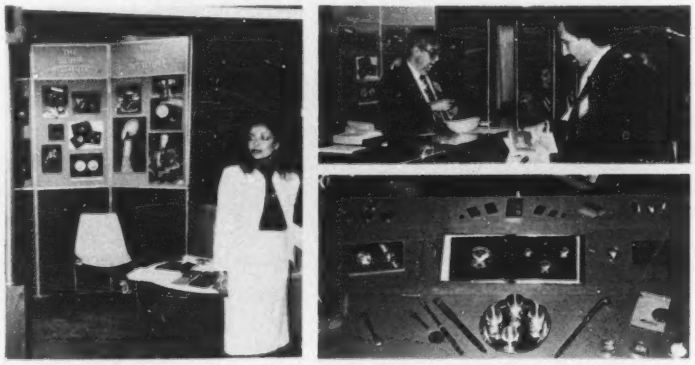
pools, and coins, medallions and other silver pieces.

Following the Board meeting, Mr. Griffith was Co-chairman of the American Mining Congress Session on Outlook for Precious Metals, with presentations by Louise du Boulay of Silver Institute member company Consolidated Gold Fields Ltd., Firoze Katrak of Charles River Associates, and John F. Rutter who described the growing use of silver halide imaging systems in industry.

The Institute provided a video cassette describing the many and varied uses of silver, and a beautiful booth display of silver products for industry, investment, and incentive awards for viewing by precious metals industry leaders who attended. Those who saw the video cassette and visited the Institute booth learned of the benefits of silver-tin solder for copper tubing, silver's life-saving bactericidal properties in the silver sulfadiazine creme used to treat serious burn victims, silver-tipped spark plugs which enable high rpm engines to function at peak efficiency, silver-containing anti-static carpeting, and a silver based information system that can store about 10,000 times the amount of data of today's magnetic systems at less cost.

SILVER INCENTIVE AND RECOGNITION AWARDS PROMOTED

"We can certainly use some of those silver 'American Prospector' medallions in our new award programs in California and Colorado." "Look at the beautiful jewelry that you can make out of those tiny silver ingots." "How much would it cost to have our company's logo reproduced on a silver pin?" "Where can we buy some of those silver golf tees?" "How do we buy these new silver U.S. Olympic coins?" "I hadn't thought of using silver awards until I saw your display today."



The Silver Institute booth exhibit at the National Premium Incentive Show (Clockwise from top right): D. U. Groves of The Silver Institute assists premium buyers; part of the silver product display; Booth Assistant Stella Daiza at booth.

These are only a few of the thousands of comments and questions that came from some of the more than **10,000 buyers of premiums, incentive and recognition awards, and planners of award programs that visited The Silver Institute exhibit** at the 50th National Premium Incentive Show and 12th Incentive Travel & Meeting Executives Show held in Chicago, October 3-6. This exhibit displayed more than 100 beautiful gleaming sterling silver and pure silver items that are being used successfully in award programs. Attractive giant enlargements of pictures of other silver premiums, awards and trophies enhanced the back wall of the exhibit.

Among the corporate buyers who visited The Silver Institute exhibit were representatives of companies such as Dairy Queen, AT&T, Rubbermaid, Cross Pens, Procter & Gamble, Reader's Digest, Sears, Kraft, Ralston Purina, Kodak, Apple Computer, Nationwide Insurance, Ford, National Safety Council, U.S. Steel, Carnation, and Champion. Enthusiastic comments were expressed regarding the "Sunshine" proof set of 999 fine silver medallions by **Sunshine Bullion**, 500 Plaza of the Americas South, Dallas, Texas 75201; pure silver ingots and medallions bearing company logos or messages minted and displayed by **Engelhard Corporation**, 70 Wood Avenue South, Iselin, N.J. 08830 and **Johnson Matthey Ltd.**, 110 Industry Street, Ontario M6M 4M1, Canada; sterling silver company logo jewelry items manufactured by **Rembrandt Jewelry Mfg. Ltd.**, 1100 Birchmount Road, Scarborough, Ontario M1K 5E5, Canada; the "Texas Nickel"—two troy ounces of pure silver—minted by the **Texas Mint**, 16475 Dallas Parkway, Suite 20, Dallas, Texas 75248. Other beautiful sterling silver award products included items from **Gorham Co.**, **Reed & Barton**, **Lunt Silversmiths**, **Kirk Stieff Co.** and the **Royal Canadian Mint**.

NEW SILVER TECHNOLOGY SHOWS WIDENING USES OF SILVER

Of the hundreds of reports of new developments on the use of silver that appeared in world scientific and patent literature, 60 advances that have greatest promise for industrial application are summarized and appear in the Silver Institute's quarterly NEW SILVER TECHNOLOGY. This is available by annual subscription at only US $30 per year from The Silver Institute, 1001 Connecticut Avenue, N.W., Suite 1140, Washington, D.C. 20036. Following are highlights of the 60 advances in the October 1983 issue.

- Philips Research Laboratories, Eindhoven, Netherlands, has found extraordinary, long-lasting lubrication performance when steel bearings are coated with silver containing a small percent of platinum.
- Toshiba Research and Development Center, Kawasaki, Japan, incorporates silver in a hydrogen permeable electrode to achieve 100% efficiency in a high performance hydrogen storage battery.
- Westinghouse Electric Corporation, Pittsburgh, PA, added a third electrode to its silver-iron batteries to extend their useful life for vehicles and communication systems.
- Imperial Chemical Industries Limited, London, has embedded silver particles in a polymer sheath on a second polymer fiber to provide long lasting anti-static properties to textiles.
- The Johns Hopkins University School of Medicine, Baltimore, MD, has developed a procedure for recording permanent silver halide images of silver-stained, virus-specific proteins, now permitting long-term studies necessary for virus control.
- Corning Glass Works, Corning, NY, created a light-darkening (photochromic) glass made with silver that is exceptionally useful for lightweight glasses and thin contact lenses.
- Silver halides are found to be remarkable conductors of CO_2 laserbeams, in patents by Robert H. Doremus of Schenectady, NY, and by Sumitomo Electric Industries of Osaka, Japan.
- Comptoir Lyon-Alemand Louyot of Paris has developed a silver electrical contact material which incorporates fine particles of nickel oxide for longtime efficient performance in high current applications.

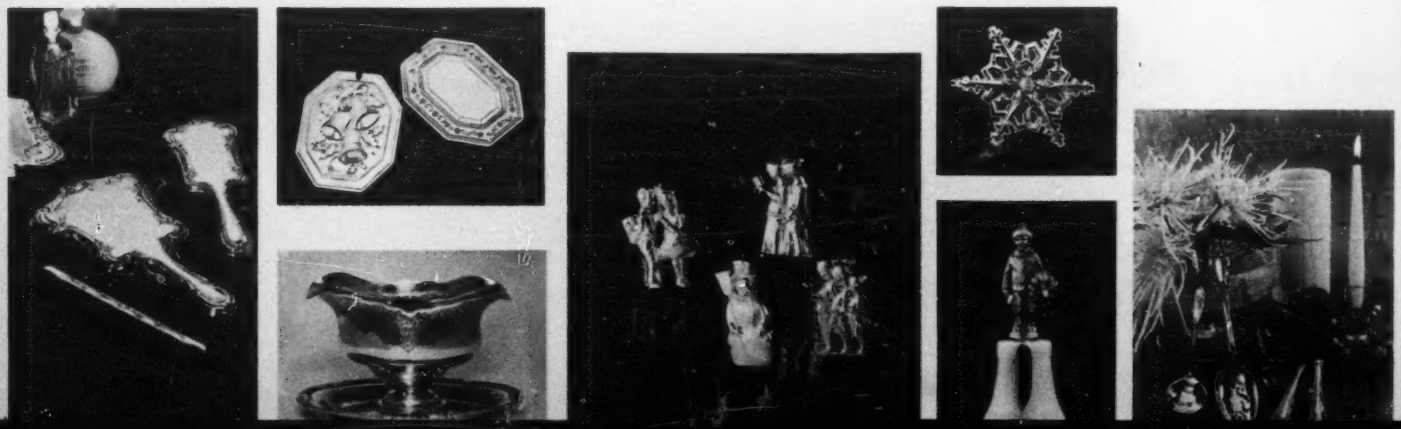
NEW MEMBER WELCOMED

The Silver Institute welcomes to membership **Nerco Minerals Company**, 3230 Airport Way, Fairbanks, Alaska 99701, represented in Institute affairs by Thomas A. Campbell, Jr., Vice President, with Lawrence E. Heiner, President, as Alternate Official Representative.

STERLING SILVER GIFTS PERFECT FOR THIS HOLIDAY SEASON

For centuries, the French have marked seasonal holidays by choosing a pattern of sterling silver tableware for their children and adding a piece to the collection with every birthday and celebration. In the United States, it is traditional for a bride to select a pattern of sterling silver tableware, and for many friends of the bride and groom to present the couple with wedding gifts of sterling silver in the bride's pattern. And as the years pass, **many of their friends continue adding to their collection by giving Christmas gifts of sterling silver to the lucky couple**.

"This tradition remains strong today, and we expect thousands of couples will be fortunate enough to receive gifts in their pattern of sterling silver during this holiday season", said Robert M. Johnston, Executive Vice-President, Sterling Silversmiths Guild of America, 600 Wyndhurst Avenue, Baltimore, Maryland 21210. He added that sterling silver Christmas Tree ornaments, sterling silver dresser sets—comb, brush, and mirror—and smaller gifts, personalized with a person's initials or a company's logo—such as calling card holders, are among the most popular sterling silver gift items this year.



MOVEMENTS OF SILVER BULLION

Just as strong and active economies attract gold, currencies and other mobile assets, so silver bullion has recently been moving from other locations to the United States.

Silver Institute reports show that the average *net movement of silver bullion to the United States* increased from 6.4 million troy ounces per month in 1982, up to 13.0 million troy ounces per month in January-August 1983, and was *26.8 million troy ounces in September*. The largest part of this came from the United Kingdom. The September net movements of silver bullion to the US in troy ounces were as follows: from United Kingdom, 19.5 million; from Mexico, 3.1 million; from Canada, 2.8 million; from Peru, 1.2 million; from other countries .2 million.

LATEST SILVER INSTITUTE REFINING STATISTICS

Production and Disposition of 999 Silver by All Known Refiners in the United States.

	TROY OUNCES		MILLION TROY OUNCES		
	August 1983	July **1983	Jan-Aug 1983	Jan-Aug **1982	Full Yr **1982
THESE REFINERS' PRODUCTION, BY SOURCE			*MONTHLY RATE*		
From Primary (ores & concentrates)	4,132,092	4,884,132	4.3	3.7	3.7
From Coins	300	0	0.0+	0.0+	0.0+
From Old Scrap (used photo film & other products)	2,587,055	2,441,339	3.0	3.5	3.3
From New Scrap (in-plant clippings, waste)*	1,622,395	1,253,996	1.6	1.7	2.0
TOTAL PRODUCTION	8,341,842	8,579,467	9.0	8.9	9.1
DISPOSITION BY THESE REFINERS					
Converted in Plant (consumed in fabricating, etc.)	3,010,435	2,240,648	3.1	2.8	3.2
Shipped Out as 999 Silver	5,464,995	3,648,422	5.5	5.7	5.9
TOTAL DISPOSITION	8,475,430	5,889,070	8.6	8.5	9.1
RESULTING CHANGE OF THESE REFINERS'			*TOTAL FOR PERIOD*		
STOCKS (Production Minus Disposition)	−133,588	+2,690,397	+2.8	+3.1	−0.2
THESE REFINERS' STOCKS AT END OF PERIOD	3,709,271	3,842,859	3.7	4.2	0.9

Production and Disposition of **999 Silver** by All Known Refiners in Australia, Canada, Mexico, Peru, South Africa, Sweden, and West Germany; and some other Refiners in Europe and Asia.

	TROY OUNCES		MILLION TROY OUNCES		
	August 1983	July 1983	Jan-Aug 1983	Jan-Aug 1982	Full Yr 1982
THESE REFINERS' PRODUCTION, BY SOURCE			*MONTHLY RATE*		
From Primary (ores & concentrates)	12,277,439	12,893,724	12.8	11.3	11.8
From Coins	35,002	160,000	0.3	0.6	0.6
From Old Scrap (used photo film & other products)	5,427,508	6,466,099	6.1	#4.8	5.0
From New Scrap (in-plant clippings, waste)*	783,325	1,061,302	1.1	#1.1	1.0
TOTAL PRODUCTION	18,523,274	20,581,125	20.3	17.9	18.4
DISPOSITION BY THESE REFINERS					
Converted in Plant (consumed in fabricating, etc.)	1,947,982	4,199,709	3.3	3.2	3.3
Shipped Out as 999 Silver	16,692,781	16,338,008	17.0	14.8	15.4
TOTAL DISPOSITION	18,640,763	20,537,717	20.3	18.0	18.7
RESULTING CHANGE OF THESE REFINERS'			*TOTAL FOR PERIOD*		
STOCKS (Production Minus Disposition)	−117,489	+43,408	−0.5	−1.1	−3.1
THESE REFINERS' STOCKS AT END OF PERIOD	4,167,678	4,285,167	4.2	6.7	4.7

* PRODUCTION From New Scrap is 999 silver made from in-plant clippings, spillage, sweepings, etc., generated during manufacturing processes. ** Includes figures of additional refiners. # Revised.

THE SILVER INSTITUTE

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INCORPORATED 1971

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